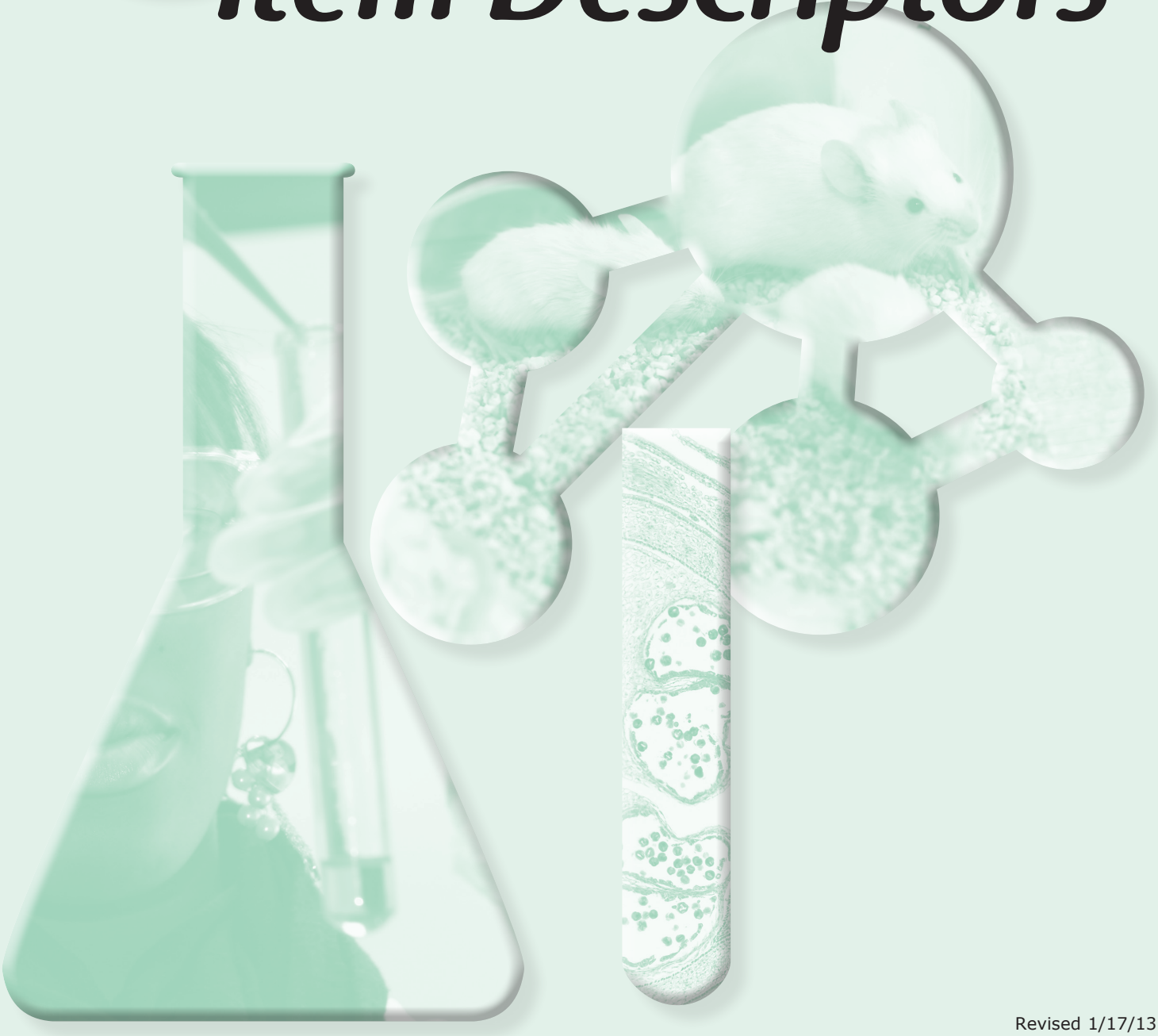
Grade 5

meap™
Michigan Educational Assessment Program

Item Descriptors

5th

8th



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SCIENCE
FALL 2012

MICHIGAN STATE BOARD OF EDUCATION

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NOTE: For each item listed throughout this booklet, the first statement is the Michigan Science Curriculum Framework (MSCF) benchmark and the second statement is the descriptor for the item's stem or question. Note that some items only occur in certain forms as indicated by the form numbers in parenthesis after the item numbers (i.e., F1=Form 1, F2=Form 2, etc.).

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Students were instructed to read the directions below silently as the test administrator read them aloud.

PART 1

DIRECTIONS:

In this part, you will answer multiple-choice science questions. Some questions will ask you to read a passage, table, or other science-related information. Use that information with what you know to answer the question.

You must mark all of your answers in Part 1 of your **Answer Document** with a No. 2 pencil. You may underline, circle, or write in this test booklet to help you, but nothing marked in this test booklet will be scored. No additional paper may be used.

Mark only one answer for each question. Completely fill in the corresponding circle on your **Answer Document**. If you erase an answer, be sure to erase completely. Remember that if you skip a question in the test booklet, you need to skip the answer space for that question on the **Answer Document**. If you are not sure of an answer, mark your **best** choice.

A Periodic Table of the Elements has been provided for your reference on the next page.

A sample question is provided for you below.

Sample Multiple-Choice Question:

Pill bugs can often be found underneath rocks and rotting logs. When exposed to light, they immediately try to find a dark place to hide. This reaction by the pill bugs is a result of

A migration.

B feeding behavior.

C energy requirements.

D changing environmental conditions.

For this sample question, the correct answer is **D**. Circle **D** is filled in for the sample question on your **Answer Document**.

Once you have reached the word **STOP** in your test booklet, do **NOT** go on to the next page. If you finish early, you may go back and check your work in Part 1 of the test **ONLY**. Check to make sure that you have answered every question. Do **NOT** look at any other part of the test.

NOTE: The directions for Part 2 are the same as the above instructions.

1 **L.OL.02.14:** Identify the needs of plants.

Recognize the resource an organism obtains based upon observation of its development in a given environment.

A correct, selected the resource the organism needed to obtain based on its observed development

B selected a resource that the organism needs, however the resource would not be obtained by the observed organism development

C selected a resource that the organism needs, however the resource would not be obtained by the observed organism development

D selected a resource that the organism needs, however the resource would not be obtained by the observed organism development

2 **(F1) L.OL.02.22:** Describe the life cycle of familiar flowering plants including the following stages: seed, plant, flower, and fruit.

Given illustrations of a common flowering plant, recognize a specified stage of plant growth.

A selected a stage of plant growth other than specified

B selected a stage of plant growth other than specified

C selected a stage of plant growth other than specified

D correctly recognized the specified stage of plant growth

2 **(F2) L.OL.03.31:** Describe the function of the following plant parts: flower, stem, root, and leaf.

Recognize the parts of a flowering plant that must function for individual plant's survival.

A selected a plant part that was still able to function

B selected a plant part that was still able to function

C selected a statement that is not true about the plant obtaining water and sunlight

D selected the correct reason why the plant would eventually die due to loss of function from a detached plant part

2 **(F3) L.OL.03.41:** Classify plants on the basis of observable physical characteristics (roots, leaves, stems, and flowers).

Distinguish the plant part having a specified observable characteristic among the same plant parts from other plants without the characteristic.

A correctly recognized the plant part having the specified characteristic

B selected a plant part not having the specified characteristic

C selected a plant part not having the specified characteristic

D selected a plant part not having the specified characteristic

2 (F4) L.OL.03.42: Classify animals on the basis of observable physical characteristics (backbone, body coverings, limbs).

Select the observable characteristic that each of four animals pictured have.

A selected a characteristic not shared by all four animals

B selected a characteristic not shared by all four animals

C selected a characteristic not shared by all four animals

D selected the characteristic shared by all four animals

2 (F5) L.OL.04.15: Determine that plants require air, water, light, and a source of energy and building material for growth and repair.

Recognize the need for plants to store energy.

A selected a concept that does not provide nutrition needed by the plant

B correctly recognized how the plant used stored energy to survive

C selected a concept that does not provide nutrition needed by the plant

D selected a concept that does not provide nutrition needed by the plant

3 L.OL.03.32: Identify and compare structures in animals used for controlling body temperature, support, movement, food-getting, and protection (for example: fur, wings, teeth, scales).

Recognize the three distinct animal body features that enable it to survive against a specified environmental threat.

A selected a set of three features where only two protect the animal from the environmental threat

B selected the three body features that shield the animal from the environmental threat

C selected a set of three features where only one protects the animal from the environmental threat

D selected a set of three features where only two protect the animal from the environmental threat

4 S.IP.04.12: Generate questions based on observations.

Based on a described observation, select the scientific question that addresses the observation made.

A selected a scientific question that does not relate to the described observation

B selected a scientific question that does not relate to the described observation

C selected a scientific question that does not relate to the described observation

D selected the scientific question that relates to inquiry on the cause of the described observation

5 (F1) S.IA.04.11: Summarize information from charts and graphs to answer scientific questions.

Given summary information in a bar graph, recognize a correct conclusion based on the graph.

A selected a fact not based on information provided by the graph

B selected a conclusion and evaluation which was not based on the information provided by the graph

C selected an opinion that could be another research inquiry based on the graph

D selected the correct conclusion based on the information provided by the graph

5 (F2) S.IA.04.11: Summarize information from charts and graphs to answer scientific questions.

Identify the data in a table that support the conclusion of a scientific investigation.

A selected an incorrect data set for a reason that does not support the investigation's conclusion

B selected the correct data set, however the reason for selection is incorrect

C selected the correct data set for the correct reason

D selected an incorrect data set using a reason that does not support the conclusion

5 (F3) S.IA.04.11: Summarize information from charts and graphs to answer scientific questions.

Select the correct conclusion based on the data presented in a bar graph.

A selected a conclusion not supported by the data provided

B selected the correct conclusion based on data presented in the graph

C selected a conclusion not supported by the data provided

D selected a conclusion not supported by the data provided

5 (F4) S.IA.04.11: Summarize information from charts and graphs to answer scientific questions.

Read and interpret information presented in a bar graph.

A recognized the correct factual information from the bar graph

B selected incorrect factual information based on bar graph

C selected incorrect factual information based on bar graph

D selected incorrect factual information based on bar graph

5 **(F5) S.IA.04.11:** Summarize information from charts and graphs to answer scientific questions.

Draw a conclusion based on information presented in a graph about a specified question.

A drew a incorrect conclusion using information in the graph

B drew an incorrect conclusion using information in the graph

C drew the correct conclusion about the specified question using information in the graph

D drew a incorrect conclusion using information in the graph

6 **P.PM.02.13:** Measure the length of objects using rulers (centimeters) and meter sticks (meters).

Given an illustration in which a scientific tool is used to measure an object, select the best estimate of the specified measure.

A selected an incorrect estimate of the specified measure

B selected an incorrect estimate of the specified measure

C correctly estimated the specified measure of the object

D selected an incorrect estimate of the specified measure

7 **(F1) P.PM.02.12:** Describe objects and substances according to their properties (color, size, shape, texture, hardness, liquid or solid, sinking or floating).

Recognize the property of a substance that makes it useful for a specified purpose.

A selected a property of the substance that is not the basis for the substance's use for the specified purpose

B selected a property that the substance does not have

C selected the property of the substance which makes it useful for the specified purpose

D selected a property that the substance does not necessarily have

7 **(F2) P.PM.02.14:** Measure the volume of liquids using common measuring tools (graduated measuring cups, measuring spoons, graduated cylinders, and beakers).

Select the correct measurement tool to use for a specified measurement situation.

A selected the wrong measurement tool

B selected the wrong measurement tool

C selected the wrong measurement tool

D selected the correct measurement tool

7 (F3) P.PM.02.15: Compare the weight of objects using balances.

Compare the relative masses of similar objects using the provided measures.

A selected an incorrect comparison statement

B selected an incorrect comparison statement

C selected an incorrect comparison statement

D correctly recognized the relative comparison of the mass measures between the two objects

7 (F4) P.PM.02.41: Recognize that some objects are composed of a single substance (water, sugar, salt) and others are composed of more than one substance (salt and pepper, mixed dry beans).

Recognize whether a substance is composed of a single chemical or is a mixture.

A selected the wrong substance classification

B selected a wrong substance classification

C selected a wrong substance classification

D correctly classified the two substances

7 (F5) P.PM.04.16: Measure the weight (spring scale) and mass (balances in grams or kilograms) of objects.

Based on an illustrated use of a spring scale to measure two different objects, draw the correct conclusion regarding how the objects differ.

A selected an incorrect conclusion for which a spring scale does not provide a measure

B selected an incorrect conclusion for which a spring scale does not provide a measure

C correct, selected the conclusion how the two objects differ based on measurement using a spring scale

D selected an incorrect conclusion for which a spring scale does not provide a measure

8 P.PM.03.51: Demonstrate how some materials are heated more than others by light that shines on them.

Recognize that materials differ in the rate in which heat is absorbed and retained when placed in direct sunlight.

A selected an incorrect concept that the distance from sunlight to object differed

B selected an incorrect concept that the warmer object got less sunlight than the cooler object

C recognized that the warmer objects must heat up more quickly when exposed to sunlight

D selected an incorrect concept that the warmer object's material cools faster than the cooler object's material

9 P.PM.03.52: Explain how we need light to see objects: light from a source reflects off objects and enters our eyes.

Understand the path light travels from source, object, and eyes in order to see an object.

A selected an incomplete light path that does not enable vision

B selected an incorrect and incomplete light path that does not enable vision

C selected an incorrect light path that does not enable vision

D selected the correct light path that does enable vision

10 (F1) P.PM.04.16: Measure the weight (spring scale) and mass (balances in grams or kilograms) of objects.

Select the appropriate scientific tool to measure a specified characteristic of an object.

A selected the wrong tool to measure the specified characteristic

B selected the wrong tool to measure the specified characteristic

C selected the wrong tool to measure the specified characteristic

D correctly selected the appropriate scientific tool to measure the specified characteristic of the object

10 (F2) P.PM.04.17: Measure volumes of liquids in milliliters and liters.

Recognized the volume of a milliliter.

A underestimated the volume of the container

B underestimated the volume of the container

C correctly estimated the volume of the container

D overestimated the volume of the container

10 (F3) P.PM.04.17: Measure volumes of liquids in milliliters and liters.

Use a specified measurement tool to obtain data.

A selected an incorrect datum value

B selected an incorrect datum value

C obtained the correct datum value with the measurement tool

D selected an incorrect datum value

10 (F4) P.PM.04.34: Demonstrate that magnetic objects are affected by the strength of the magnet and the distance away from the magnet.

Given pictures of two magnets indicating each magnet's relative strength, identify the best magnet for a specified task.

A selected incorrect magnet though appropriate distance for demonstration of the magnet's force

B selected incorrect magnet and the wrong distance for demonstration of the magnet's force

C correctly selected the magnet and the appropriate distance for demonstration of the magnet's force

D selected the correct magnet, however the wrong distance for demonstration of the magnet's force

10 (F5) P.PM.04.53: Identify objects that are good conductors or poor conductors of heat and electricity.

Given a set of four properties which describe an inanimate material, select the type of material.

A selected material that cannot exhibit one of the four properties

B selected material that cannot exhibit one of the four properties

C selected material that cannot exhibit two of the four properties

D correct, selected material that can exhibit all four properties

11 P.PM.04.23: Compare and contrast the states (solids, liquids, gases) of matter.

Scale the state of matter temperature requirements for water (under standard pressure conditions).

A correctly identified the temperature points where water undergoes a state of matter change

B incorrectly identified the temperature points where water undergoes a state of matter change

C incorrectly identified the temperature points where water undergoes a state of matter change

D incorrectly identified the temperature points where water undergoes a state of matter change

12 P.CM.04.11: Explain how matter can change from one state (liquid, solid, gas) to another by heating and cooling.

Understand gain and loss of energy as basis for change in state of matter.

A selected an incorrect mixture concept to use as basis for change in state of matter

B selected an incorrect concept to use as a basis for change in state of matter

C selected an incorrect energy condition for the substance to change to the specified state of matter

D recognized the basis for the substance's specified change in state of matter

13 (F1) P.FM.03.22: Identify the force that pulls objects towards the Earth.

Describe how a noncontact force moves a falling object toward Earth.

A selected an incorrect description of how the noncontact force moves a falling object

B selected the correct description how the noncontact force acts on an object to cause it to fall to Earth

C selected an incorrect description of how the noncontact force moves a falling object

D selected an incorrect description of how the noncontact force moves a falling object

13 (F2) P.FM.03.35: Describe how a push or a pull is a force.

Identify the source of the force causing the motion of the specified object.

A misidentified the source of energy enabling the force to move the object

B correct, selected the force acting on the object that causes the object to move in the specified direction

C selected a force that does not cause the sled to move in the specified direction

D selected an incorrect direction of force that would cause the object to move

13 (F3) P.FM.03.35: Describe how a push or a pull is a force.

Recognize the source of the force used to move an object.

A selected an incorrect source of force

B correctly recognized the source of the force that moved the object as described

C selected an incorrect source of force

D selected an incorrect source of force

13 (F4) P.FM.03.43: Relate the speed of an object to the distance it travels in a standard amount of time.

Using the distance and time data provided, determine which participant had the fastest speed.

A selected a slower participant

B selected a slower participant

C recognized the participant that traveled the fastest

D selected a slower participant

13 (F5) P.FM.03.36: Relate a change in motion of an object to the force that caused the change of motion.

Given a situation, recognize the force that caused an object's change in motion.

A correct, recognized the force that acted on the object to change its motion

B selected a force that did not act on the object to change its motion

C selected a statement that indicated energy was a force

D selected a force that did not act on the object to change its motion

14 S.IA.04.12: Share ideas about science through purposeful conversation in collaborative groups.

Recognize the best methods for communication of scientific results.

A left the understanding of the investigation results to uncontrolled interpretation

B left the understanding of the investigation results to uncontrolled interpretation

C left the understanding of the investigation results to uncontrolled interpretation

D selected a presentation that guided the understanding and interpretation of the investigation results

15 E.SE.03.13: Recognize and describe different types of Earth materials (mineral, rock, clay, boulder, gravel, sand, soil, water, and air).

Identify the correct description of a specified earth material.

A selected an incorrect description of the specified earth material

B correctly identified a description of the specified earth material

C selected an incorrect description of the specified earth material

D selected an incorrect description of the specified earth material

16 (F1) E.FE.02.11: Identify water sources (wells, springs, lakes, rivers, oceans).

Recognize sources of water that are used for a specified purpose.

A selected water sources of which one is not a source for the specified purpose

B selected water sources of which one is not a source for the specified purpose

C correctly recognized water sources that are used for the specified purpose

D selected water sources of which one is not a source for the specified purpose

16 (F2) E.FE.02.13: Describe the properties of water as a liquid (visible, flowing, shape of container) and recognize rain, dew, and fog as water in its liquid state.

Recognize a pair of words that describe water characteristics in a specified Earth surface feature under specific climate conditions.

A correctly selected one word that describes the water but incorrectly chose the other word which names a type of water

B correctly recognized the pair of words that appropriately describe water in the Earth-surface feature under the specified climatic conditions

C correctly selected one word that describes the water but incorrectly chose the other word which names water in a different state of matter

D correctly selected one word that describes the water but incorrectly chose the other word which names a type of water

16 (F3) E.FE.02.13: Describe the properties of water as a liquid (visible, flowing, shape of container) and recognize rain, dew, and fog as water in its liquid state.

Recognize the name for liquid water that occurs under the described weather conditions.

A correctly selected the name for liquid water that forms under the described conditions

B selected a name for solid water

C selected the name for a water cycle process

D selected the name for a water cycle process

16 (F4) E.FE.02.14: Describe the properties of water as a solid (hard, visible, frozen, cold) and recognize ice, snow, and hail as water in its solid state.

Given a substance and its current state of matter, identify characteristics of the substance.

A correctly identified three characteristics of the substance in its current state of matter

B incorrectly selected two of three characteristics for the substance in its current state of matter

C incorrectly selected two of three characteristics for the substance in its current state of matter

D incorrectly selected two of three characteristics for the substance in its current state of matter

16 (F5) E.FE.02.14: Describe the properties of water as a solid (hard, visible, frozen, cold) and recognize ice, snow, and hail as water in its solid state.

Based on the data provided, select the period having the most time where water occurred in a specified state of matter.

A selected a category having more time with water in states of matter other than the specified state

B selected a category having less time with water in the specified state of matter than another category

C selected the correct category having most time with water in the specified state of matter

D selected a category having more time with water in states of matter other than the specified state

17 E.SE.03.22: Identify and describe natural causes of change in the Earth's surface (erosion, glaciers, volcanoes, landslides, and earthquakes).

Using the diagram provided, identify the cause of the specified land feature.

A selected a very unlikely cause for the specified land feature

B correctly recognized the most likely cause for the specified land feature

C selected a very unlikely cause for the specified land feature

D selected a very unlikely cause for the specified land feature

18 E.ES.03.41: Identify natural resources (metals, fuels, fresh water, fertile soil, and forests).

Distinguish natural resources from other objects or materials.

A incorrectly identified the list of objects or materials as living organisms

B incorrectly identified the list of objects or materials as man-made products

C correctly identified the list of objects or materials as natural resources

D incorrectly identified the list of objects or materials as man-made products

19 (F1) E.ST.04.11: Identify the sun and moon as common objects in the sky.

Provided a list of space objects, identify which are visible during day and night without special scientific tools.

A selected objects in space that are only seen at night

B selected objects in space that are only seen at night

C correctly selected an object in space that can be seen during day or night

D selected an object in space that is only seen during the day

19 (F2) E.ST.04.12: Compare and contrast the characteristics of the sun, moon and Earth, including relative distances and abilities to support life.

Realize the real and apparent size of celestial bodies when viewed from Earth.

A realize that the relative distance of an object to an observer affects perceived size

B selected an unfounded statement how light magnifies the perceived image of a celestial body

C selected an unfounded statement how absence of light magnifies the perceived image of a celestial body

D selected an unfounded statement a specific type of reflected light influences the perceived image of a celestial body

19 (F3) E.ST.04.25: Describe the apparent movement of the sun and moon across the sky through day/night and the seasons.

Relate sunlight's shadow effects to direction and time.

A selected the wrong time of day

B recognized the correct time of day for the specified shadow effect

C selected the wrong time of day

D selected the wrong time of day

19 (F4) E.ST.04.31: Explain how fossils provide evidence of the history of the Earth.

Use geologic information presented in an illustrated rock-layer formation to support a conclusion based on the information.

A drew correct conclusion about illustrated objects' relative age

B drew a conclusion about the objects' environment though no data on environment were provided

C drew a conclusion related to a geologic event though no information was provided regarding any such event

D drew a conclusion related to a geologic event though no information was provided regarding any such event

19 (F5) E.ST.04.32: Compare and contrast life forms found in fossils and organisms that exist today.

Use comparative evidence between fossils and living organisms to understand differences in the animals' ecosystem characteristics.

A correctly recognized the likely ecosystem characteristic that was related to the difference in the specified animals' body feature

B incorrectly used the comparative evidence as basis for differences in the animals' natural history unrelated to the cited evidence

C incorrectly selected an ecosystem characteristic difference that would not be related to the evidence from the comparative body feature

D incorrectly selected an ecosystem characteristic difference that would not be related to the evidence from the comparative body feature

20 E.ES.03.42: Classify renewable (fresh water, fertile soil, forests) and non-renewable (fuels, metals) resources.

Identify natural resources that were misclassified as renewable or non-renewable.

A correct, identified the two natural resources that were misclassified in a given table of 6 natural resources

B selected two natural resources that were classified correctly in a given table of 6 natural resources

C incorrect, selected a pair of natural resources where only one was misclassified in a given table of 6 natural resources

D incorrect, selected a pair of natural resources where only one was misclassified in a given table of 6 natural resources

21 S.IA.04.13: Communicate and present findings of observations and investigations.

Recognize the most likely conclusion, from the list provided, based on the data presented in a table.

A this conclusion has no basis in the data provided

B this conclusion has no basis in the data provided

C this conclusion has no basis in the data provided

D recognized the conclusion that is supported by the data provided in the table

22 S.IP.04.15: Make accurate measurements with appropriate units (millimeters, centimeters, meters, milliliters, liters, Celsius, grams, seconds, minutes) for the measurement tool.

Given a specific measurement task, recognize the best measurement unit in which to gather the measurement data.

A selected the best measurement unit for the specific task

B incorrectly selected a measurement unit that does not address the specific task

C selected a measurement having too large of a scale

D incorrectly selected a measurement unit that does not address the specific task

23 S.RS.04.11: Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.

Given an illustration using scientific measurement tools and a liquid, recognize two properties of a liquid.

A incorrectly selected one property but correctly recognized the other property of the liquid

B incorrectly selected two properties of a liquid

C correctly recognized the two properties of a liquid

D correctly recognized one property but incorrectly selected the other property of the liquid

24 (F1) S.IP.04.11: Make purposeful observation of the natural world using the appropriate senses.

Appropriately interpret information provided by an illustrated investigative observation.

A did not recognize the pattern of data provided by the illustrated observation

B did not recognize the pattern of data provided by the illustrated observation

C did not recognize the pattern of data provided by the illustrated observation

D correctly recognized the pattern of data provided by the illustrated observation

24 (F2) S.IP.04.13: Plan and conduct simple and fair investigations.

Understand necessary steps in the sequence of a scientific investigation to carry out the investigation's intent.

A selected a step that does not satisfy the investigation's attempt

B selected a step that does not satisfy the investigation's attempt

C recognized the correct step to test the investigation's intent (hypothesis)

D selected a step that does not satisfy the investigation's attempt

24 (F3) S.IP.04.13: Plan and conduct simple and fair investigations.

Recognize the necessary step and sequence of steps to test an investigation's intent (hypothesis).

A selected a step that would not test the investigation's intent

B selected a step that is not relevant to the investigation's intent

C correctly selected the step that would test the investigation's intent with empirical data

D selected a step that would gather opinion and not test the investigation's intent

24 (F4) S.IP.04.14: Manipulate simple tools that aid observation and data collection (for example: hand lens, balance, ruler, meter stick, measuring cup, thermometer, spring scale, stop watch/timer, graduated cylinder/beaker).

Recognize which of the listed materials is best observed with the specified scientific tool.

A correctly recognized the type of material the specified tool can best aid in observation

B selected an object that is not well observed with the specified scientific tool

C selected objects that are not well observed with the specified scientific tool

D selected an object that is not well observed with the specified scientific tool

24 (F5) S.IP.04.14: Manipulate simple tools that aid observation and data collection (for example: hand lens, balance, ruler, meter stick, measuring cup, thermometer, spring scale, stop watch/timer, graduated cylinder/beaker).

Identify the correct scientific measurement tool to carry out a specified measurement task.

A selected a tool that is used to make the specified measurement task

B selected a tool that does not make the necessary measurement

C selected a tool that does not make the necessary measurement

D selected a tool that does not make the necessary measurement

25 S.RS.04.15: Use evidence when communicating scientific ideas.

Recognize the best scientific technique used to validate a new scientific claim.

A correctly selected the best technique for evaluation of scientific results

B selected a technique that would rely on second hand opinion about the scientific claim and which could include opinions from those not proficient in the specific science

C selected a technique that could be biased and would not include independent review

D selected a method that would bring about live interaction, discussion, and sharing opinion on the scientific claim; no mention this would consider investigation design

26 **S.RS.04.18:** Describe the effect humans and other organisms have on the balance of the natural world.

Recognize a negative consequence of human activity with a specified environment.

A correctly identified a negative consequence of the described human activity in a specified environment

B selected a consequence that does not occur due to the human activity

C selected a consequence that does not occur due to the human activity

D selected a positive consequence that would occur due to the human activity

27 **E.FE.02.12:** Identify household uses of water (drinking, cleaning, food preparation).

Recognize and prioritize the use of household water.

A selected one correct and one incorrect priority use for household water

B recognized the two high priority uses for household water

C selected one correct and one incorrect priority use for household water

D selected one correct and one incorrect priority use for household water

28 **(F1) E.ES.03.43:** Describe ways humans are protecting, extending, and restoring resources (recycle, reuse, reduce, renewal).

Identify the benefits from reusing materials in a specified situation.

A misidentified reuse with another conservation activity, the stated benefit will not occur via reuse

B misidentified the benefit from reuse, the stated benefit does not occur from reuse activity

C misidentified the benefit from reuse, the stated benefit does not occur from reuse activity

D correct, recognized the benefit; reusing materials will decrease demand on limited resources

28 **(F2) E.ES.03.44:** Recognize that paper, metal, glass, and some plastics can be recycled.

Given a choice of four materials, identify the material that can be recycled.

A selected a material that cannot be recycled

B selected a material that cannot be recycled

C correctly identified the recyclable material

D selected a material that cannot be recycled

28 (F3) E.ES.03.51: Describe ways humans are dependent on the natural environment (forests, water, clean air, Earth materials) and constructed environments (homes, neighborhoods, shopping malls, factories, and industry).

Given a list of four pairs of natural resource materials, identify the pair of resources most likely used as materials to build a specified public infrastructure.

A selected a pair of natural resource materials where only one is readily used to build the specified infrastructure

B selected a pair of natural resource materials that historically were used to build the specified infrastructure, but are no longer used for this purpose

C selected a pair of natural resource materials where only one material was used in prior years, but is no longer used to build the specified infrastructure, the other material has no use in construction of the infrastructure

D correct, selected the pair of natural resource materials that are readily used to build the specified infrastructure

28 (F4) E.ES.03.52: Describe helpful or harmful effects of humans on the environment (garbage, habitat destruction, land management, renewable, and non-renewable resources).

Identify the human activity from those provided that best benefits Earth's environment.

A selected an activity that discharges chemicals into the atmosphere

B selected an activity that does not minimize trash or uses less-expensive resources

C selected an activity that disposes of resources that could otherwise be recycled

D correctly selected activities that reuse materials for other purposes.

28 (F5) E.ES.03.52: Describe helpful or harmful effects of humans on the environment (garbage, habitat destruction, land management, renewable, and non-renewable resources).

Given a land management situation regarding removal of excess water, identify the best method to remove the excess water.

A selected a land management activity that will enable more excess water accumulation

B selected a land management activity that will enable more excess water accumulation

C correct, selected the best land management method to remove excess water and prevent excess water accumulation

D selected a land management method that will merely move, if successful, the excess water from one location to another location that would then have excess water

29 E.FE.02.21: Describe how rain collects on the surface of the Earth and flows downhill into bodies of water (streams, rivers, lakes, oceans) or into the ground.

Understanding the flow of water on Earth toward other surface features.

A selected a process that does not track how water flows to the specified Earth surface features

B selected a process that manipulates how water flows to any location by human management of the resource

C selected a process that does track how water flows to the specified Earth surface features

D correctly recognized how water flows across Earth's surface to the specified surface features without human manipulation of the flow

30 E.ST.04.22: Explain that the spin of the Earth creates day and night.

Understand the basis for daylight and nighttime on Earth.

A incorrectly selected Earth's revolution as basis

B selected an incorrect statement about Earth and Sun revolution

C selected a correct statement about Earth's rotation

D selected an incorrect statement about the Sun's rotation

31 (F1) E.SE.02.21: Describe the major landforms of the surface of the Earth (mountains, plains, plateaus, valleys, hills).

Recognize types of landforms based on description.

A selected an incorrect landform for the description

B selected an incorrect landform for the description

C recognized the correct type of landform

D selected an incorrect landform for the description

31 (F2) E.SE.02.21: Describe the major landforms of the surface of the Earth (mountains, plains, plateaus, valleys, hills).

Recognize features that distinguish types of Earth's surface landforms.

A correctly identified one surface landform having the specified feature but incorrectly selected another surface landform

B correctly identified the surface landform types having the specified feature

C correctly identified one surface landform having the specified feature but incorrectly selected another surface landform

D correctly identified one surface landform having the specified feature but incorrectly selected another surface landform

31 (F3) E.SE.03.14: Recognize that rocks are made up of minerals.

Recognize the characteristic that universally applies to rocks

A selected an untrue statement since there is no difference in this feature between the rock and its components

B selected a statement about rock characteristics and its component's characteristics that is not true

C selected the correct characteristic regarding rock composition

D selected a statement that incorrectly reverses the scale of a rock and its components

31 (F4) E.SE.03.31: Identify Earth materials used to construct some common objects (bricks, buildings, roads, glass).

Recognize which Earth materials are used for construction.

A misclassified the listed Earth materials

B misclassified the listed Earth materials

C correctly classified the Earth materials used for construction

D misclassified the listed Earth materials

31 (F5) E.SE.03.31: Identify Earth materials used to construct some common objects (bricks, buildings, roads, glass).

Recognize how a specified common Earth material is used in construction.

A selected an incorrect example how the specified Earth material is used for construction

B correctly recognized how the specified Earth material is used for construction

C selected an incorrect example how the specified Earth material is used for construction

D selected an incorrect example how the specified Earth material is used for construction

32 E.ST.04.24: Explain how the visible shape of the moon follows a predictable cycle which takes approximately one month.

Recognize the basis for the change in appearance of the moon across the monthly lunar cycle.

A recognized the correct basis for the change in the moon's appearance

B selected an incorrect fact as basis for the moon's appearance change

C selected an incorrect fact as basis for the moon's appearance change

D selected an incorrect fact as basis for the moon's appearance change

33 (F1) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Using a brief description of a research project and given a data table, identify the types of information the data provide.

A selected two correct types of information and one incorrect type of information

B correct, student identified the three types of information presented in the data table

C incorrect, indicated that the data table provided three distinct steps of the scientific inquiry process, not types of data

D selected two correct types of data information and one incorrect type of information

33 (F2) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Given a described lab exercise and a table of data based on the exercise, recognize the best source of evidence that supports the conclusion from the lab work.

A correct, recognized the best source of evidence to support the conclusion of the lab project

B selected a process from the lab exercise that is unrelated to the conclusion of the lab project

C selected a step in the scientific process which, if it alone supported the conclusion, would make the lab project unnecessary

D incorrectly indicated that a majority of opinion offsets the valid empirical evidence obtained from the project

33 (F3) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Distinguish between statements of fact and opinion.

A incorrectly recognized the classification of the specified statement

B incorrectly recognized the classification of the specified statement

C correctly recognized and classified the specified statement's type

D incorrectly recognized the classification of the specified statement

33 (F4) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Given a table of monthly average temperatures in Detroit, identify the statement of opinion, rather than fact, based on information in the table.

A selected a statement of fact

B selected a statement of fact

C correct, selected the opinion statement

D selected a statement of fact

33 (F5) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Select the best research method to answer an empirical scientific question.

A selected a method that only provides an opinion, not data from a valid research design.

B selected a method that only provides an opinion, not data from a valid research design.

C correctly selected the method which would use a controlled research design that systematically gathers empirical data to provide objective information to answer the scientific question

D selected a non-specific measurement for which no use is described that would answer the scientific question.

34 S.IA.04.14: Develop research strategies and skills for information gathering and problem solving.

Identify the best strategy, among the strategies listed, to gather information about a scientific problem.

A selected a strategy that can provide general, non-expert information

B selected a strategy that can provide general, non-expert information

C selected a strategy that is off topic

D selected the best strategy that can provide specific and expert information

35 P.FM.03.37: Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.

Recognize the amount of force required to move objects.

A selected an insufficient amount of force to move the object

B selected an insufficient amount of force to move the object

C correctly recognizes the amount of force needed to move the object

D selected an insufficient amount of force to move the object

36 (F1) P.FM.03.36: Relate a change in motion of an object to the force that caused the change of motion.

Identify the force which caused the motion of an object in a specified situation.

A selected an incorrect force

B selected an incorrect force

C selected an incorrect force

D correctly selected the force that would cause the motion of the object

36 (F2) P.FM.03.42: Identify changes in motion (change direction, speeding up, slowing down).

Based on the description, recognize the correct change in direction and correct change in speed of a specified object relative to the group of remaining objects

A selected an incorrect description about the object's change in speed and direction relative to the group of objects

B selected correct description of the specified object's change in speed and direction relative to the group of objects

C selected an incorrect description about the object's change in speed and direction relative to the group of objects

D selected an incorrect description about the object's change in speed and direction relative to the group of objects

36 (F3) P.FM.03.42: Identify changes in motion (change direction, speeding up, slowing down).

Understand how an object changes speed while in a specified motion situation.

A selected a point on the object's path where the object does not have the specified speed

B selected a point on the object's path where the object does not have the specified speed

C recognized the point on the object's path where the object has the specified speed

D selected a point on the object's path where the object does not have the specified speed

36 (F4) P.FM.03.36: Relate a change in motion of an object to the force that caused the change of motion.

Given a specified situation of an object in motion, recognize the force that causes the object to accelerate and decelerate.

A selected a force that did not apply to the specific situation

B selected a force that would not change object velocity as described in the specific situation

C selected the force that would cause the object to accelerate or decelerate under the specified condition

D selected a force that did not apply to the specific situation

36 (F5) P.FM.03.43: Relate the speed of an object to the distance it travels in a standard amount of time.

An object moved a given distance in a specified time; calculate the object's speed.

A selected an incorrect rate of speed

B selected an incorrect rate of speed

C selected an incorrect rate of speed

D correctly calculated the object's speed

37 P.FM.03.38: Demonstrate when an object does not move in response to a force, it is because another force is acting on it.

Recognize the correct reason why an object does not move, though an observed effort (i.e., force) is made to move it.

A selected an incorrect statement that no force was applied to the object

B selected the correct statement that another force is concurrently being applied to the object

C selected the incorrect statement that gravity has no effect on the object

D selected the incorrect statement that gravity increases as a force is applied to the object

38 (F1) P.EN.03.21: Demonstrate that light travels in a straight path and that shadows are made by placing an object in a path of light.

Identify the path of light from its source using shadow evidence.

A selected the wrong light path

B selected the wrong light path

C selected the wrong light path

D correctly recognized the path of light from its source

38 (F2) P.EN.03.21: Demonstrate that light travels in a straight path and that shadows are made by placing an object in a path of light.

Understand how shadows occur.

A selected an incorrect statement indicating that shadows are associated with light frequency change

B selected an incorrect statement about light transmission as necessary for shadows to occur

C correct, recognized how shadows occur regarding light transmission

D selected an incorrect statement about the path of light necessary for shadows to occur

38 (F3) P.EN.03.31: Relate sounds to their sources of vibrations (for example: a musical note produced by a vibrating guitar string, the sounds of a drum made by the vibrating drum head).

Understand how sounds are produced.

A selected a physical process that does not produce sound

B selected a physical process that does not produce sound

C selected a physical process that does not produce sound

D correctly recognized the physical process that produces a sound wave

38 (F4) P.EN.04.43: Describe how heat is produced through electricity, rubbing, and burning.

Identify the correct energy transformation in a specific situation.

A did not identify the correct energy transformation

B identified the correct energy transformation

C did not identify the correct energy transformation

D did not identify the correct energy transformation

38 (F5) P.EN.04.41: Demonstrate how temperature can be increased in a substance by adding energy.

Describe what will happen to the temperature of a cooler object as soon as a warmer object is placed inside and in contact with the cooler object.

A selected an incorrect description of how the temperature of the cooler object will change

B selected an incorrect description of how the temperature of the cooler object will change

C selected an incorrect description of how the temperature of the cooler object will change

D selected the correct description how the temperature of the cooler object will change due to heat transfer

39 P.EN.03.11: Identify light and sound as forms of energy.

Describe lightning and thunder, using the statements provided.

A selected an incorrect description of lightning and thunder as forms of the same type of energy

B selected an incorrect description of lightning and thunder as forms of the same type of energy

C correctly selected the description of lightning and thunder as forms of energy

D selected an incorrect description of lightning and thunder as forms of the same type of energy

40 P.EN.03.22: Observe what happens to light when it travels from air to water (a straw half in the water and half in the air looks bent).

Understand why objects, reflecting light to the eye through water, appear different compared to the same object reflecting the light to the eye not through water.

A selected the wrong effect regarding light transmission from the object

B correctly recognized that different media (e.g., water) bends the path of light as it transmits through the media to the eye

C selected the wrong effect regarding light transmission from the object

D selected the wrong effect regarding light transmission from the object

41 (F1) P.EN.04.41: Demonstrate how temperature can be increased in a substance by adding energy.

Using data provided, draw a conclusion about the effects of energy applied in a specified investigation.

A drew a conclusion that can not be substantiated by the investigation

B drew a conclusion that is not found in the provided results data

C drew a conclusion that contradicts the data from the investigation

D drew the correct conclusion about application of variable amounts of energy to the differing conditions of the investigation

41 (F2) P.EN.04.42: Describe heat as the energy produced when substances burn, certain kinds of materials rub against each other, and when electricity flows through wire.

Recognize the type of energy produced by three specified processes.

A misidentified the energy type that is generated by the three specified processes

B correctly recognized that the three specified processes generate heat energy

C misidentified the energy type that is generated by the three specified processes

D misidentified the energy type that is generated by the three specified processes

41 (F3) P.EN.04.42: Describe heat as the energy produced when substances burn, certain kinds of materials rub against each other, and when electricity flows through wire.

Recognize the two forms of energy associated with an open flame.

A selected two forms of energy where only one is given off by an open flame

B selected two forms of energy where only one is given off by an open flame

C selected two forms of energy where only one is given off by an open flame

D recognized the two forms of energy associated with an open flame

41 (F4) P.EN.04.43: Describe how heat is produced through electricity, rubbing, and burning.

Recognize methods by which heat energy can be produced.

A selected a form of energy that is not produced by the activity

B correctly recognized how the heat energy was produced

C selected a condition that does not produce heat energy

D selected a source of heat energy that was not used or present for the activity to produce the heat energy

41 (F5) P.EN.04.52: Demonstrate magnetic effects in a simple electric circuit.

From a list of six common objects of known material, select the set of three objects needed to make an electromagnet.

A correctly identified the three objects needed to make an electromagnet

B selected an incorrect set of three objects, of which one object can not be used to make an electromagnet

C selected an incorrect set of three objects, of which one object can not be used to make an electromagnet

D selected an incorrect set of three objects, of which one object can not be used to make an electromagnet

42 P.EN.04.51: Demonstrate how electrical energy is transferred and changed through the use of a simple circuit.

Given six components used in electrical circuits, select the set of three that are needed to prepare a functional closed circuit.

A selected a set of three components that does not include a power source

B selected a set of three components that does not include material to carry the current

C correct, selected the set of three components that can form a complete functional closed circuit

D selected a set of three components that does not include material to carry the current

43 (F1) S.RS.04.14: Use data/samples as evidence to separate fact from opinion.

Select the best research method to answer an empirical scientific question.

A selected a method that only provides an opinion, not data from a valid research design.

B selected a method that only provides an opinion, not data from a valid research design.

C correctly selected the method which would use a controlled research design that systematically gathers empirical data to provide objective information to answer the scientific question

D selected a non-specific measurement for which no use is described that would answer the scientific question.

43 (F2) S.RS.04.16: Identify technology used in everyday life.

Among four sources of evidence, identify the best technology used to confirm a specified conclusion.

A inappropriately selected outdated records as the best reference to confirm a modern conclusion

B correct, selected the best source of evidence based on technology to support the conclusion

C selected a source of incomplete evidence as the best to confirm the conclusion

D selected a source of incomplete evidence as the best to confirm the conclusion

43 (F3) S.RS.04.17: Identify current problems that may be solved through the use of technology.

Determine whether efforts to gather data or prepare research information involved the application of technology-based methods.

A selected a technology-based effort to gather research information

B selected a technology-based effort to gather research information

C correctly identified the information gathering effort that did not involve technology

D selected a technology-based effort to prepare research information

43 (F4) S.RS.04.17: Identify current problems that may be solved through the use of technology.

From the four options, select the best technological application to address the specified problem.

A selected a technology that does not satisfy the specified problem

B selected a technology that does not satisfy the specified problem

C selected a technology that does not satisfy the specified problem

D correct, selected a valid and reliable technology that addresses and eliminates the specified problem issue

43 (F5) S.RS.04.17: Identify current problems that may be solved through the use of technology.

Determine whether efforts to gather data or prepare research information involved the application of technology-based methods.

A selected a technology-based effort to gather research information

B selected a technology-based effort to gather research information

C correctly identified the information gathering effort that did not involve technology

D selected a technology-based effort to prepare research information

44 S.IP.04.16: Construct simple charts and graphs from data and observations.

Given a table of data, recognize the graph that accurately presents specified data from the table.

A correct, selected the graph that accurately represents the data by category

B selected a graph that misrepresents the data by category

C selected a graph that misrepresents the data by category

D selected a graph that misrepresents the data by category

45 L.EC.04.21: Explain how environmental changes can produce a change in the food web.

Based on a brief description about an organism and a display of the organism within a food web, identify the most harmful threat to the organism's survival.

A selected a statement that does not reasonably threaten the organism's survival

B selected a statement that would promote the organism's survival

C selected a statement that would have no threat to the organism's survival

D correctly selected the statement where the organism's survival would be threatened by a specific environmental change

46 L.EV.04.21: Identify individual differences (color, leg length, size, wing size, leaf shape) in organisms of the same kind.

Recognize which characteristic is best used to determine young to parent.

A selected a characteristic that does not associate young to parent

B selected a characteristic that does not associate young to parent

C selected a characteristic that does not associate young to parent

D selected the characteristic used to identify young and parent

47 (F1) L.EV.03.11: Relate characteristics and functions of observable parts in a variety of plants that allow them to live in their environment (leaf shape, thorns, odor, color).

Recognize that plant characteristic that is adaptive for survival in a specified environment.

A selected a plant characteristic that is not adaptive for survival in the specified environment

B selected a plant characteristic that is not adaptive for survival in the specified environment

C correctly selected the plant characteristic best adaptive for plant survival in the specified environment

D selected a plant characteristic that is not adaptive for survival in the specified environment

47 (F2) L.EV.03.12: Relate characteristics and functions of observable body parts to the ability of animals to live in their environment (sharp teeth, claws, color, body coverings).

Given a specified animal characteristic, recognize the survival value this characteristic has for the animal.

A selected a survival value that is not a function of the characteristic

B selected a survival value that is not a function of the characteristic

C correct, selected the survival value the animal has from this characteristic

D selected a species survival value not related to this animal characteristic

47 (F3) L.EV.03.12: Relate characteristics and functions of observable body parts to the ability of animals to live in their environment (sharp teeth, claws, color, body coverings).

Identify the body part, characteristic of a specified animal (illustration), used for survival under certain environmental conditions.

A selected a characteristic not applicable for survival under the given environmental conditions

B selected a characteristic not applicable for survival under the given environmental conditions

C selected the body part characteristic directly applicable for survival under the given environmental conditions

D selected a characteristic not applicable for survival under the given environmental conditions

47 (F4) L.EV.04.22: Identify how variations in physical characteristics of individual organisms give them an advantage for survival and reproduction.

Using a table of characteristics for 2 plants, identify the characteristic that gives one plant a survival advantage over the other in the specified environment.

A selected a characteristic that is the same for both plants, no advantage

B selected a characteristic that is the same for both plants, no advantage

C selected a characteristic that is the same for both plants, no advantage

D correctly selected the characteristic that gives one plant the survival advantage over the other in the specified environment

47 (F5) L.EV.04.22: Identify how variations in physical characteristics of individual organisms give them an advantage for survival and reproduction.

Recognize how a specified animal relies on its body characteristics to survive.

A selected the body feature that will enable the animal to obtain food and defend itself

B selected a body feature that will reduce the animal's ability to obtain food and defend itself

C selected a body feature that will reduce the animal's ability to obtain food and defend itself

D selected a body feature that will reduce the animal's ability to obtain food and defend itself

48 L.HE.02.13: Identify characteristics of plants (for example: leaf shape, flower type, color, size) that are passed on from parents to young.

Understand the source of plant traits.

A correctly recognized the genetic basis for an organism's traits

B selected an incorrect source of an organism's traits

C selected an incorrect source and incorrect basis for an organism's traits

D selected an incorrect source and incorrect basis for an organism's traits

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